A Fisheries Survey of Shriner Lake, Whitley County, Indiana, June 2004

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INTRODUCTION

Shriner Lake, located in Whitley County, Indiana, is a 120-acre natural lake with a maximum depth of 75 ft. Access to this lake is limited to a privately owned boat ramp and a county road easement. Water quality in this lake has typically been excellent; consequently, trout were stocked annually from 1954 to 1997 (Table 1). The last fisheries survey conducted on this lake was in 1981, when growth and survival of stocked trout was evaluated. Trout stocking was discontinued in this lake due to the lack of public access.

Table 1. Species, number, and sizes of fish stocked into Shriner Lake, Whitley County. Stocking records from 1954 to 1975 were not kept for this lake.

Year	Species	Number	Size Range (in)
1976	Rainbow trout	2,000	6.8-7.5
1978	Rainbow trout	2,500	8.2
1980	Rainbow trout	2,000	7.5
1981	Brown trout	2,000	8.2
1982	Brown trout	2,000	8.0
1982	Rainbow trout	1,000	7.3
1983	Brown trout	1,000	8.62
1983	Rainbow trout	1,000	6.8-7.62
1984	Rainbow trout	1,000	9.07
1985	Rainbow trout	1,500	9.9
1986	Rainbow trout	1,000	6.0-9.5
1987	Rainbow trout	1,000	8-12
1988	Rainbow trout	1,000	8-14
1989	Rainbow trout	1,000	9-11
1990	Rainbow trout	1,000	8.5-12.5
1991	Rainbow trout	907	10.0-11.0
1992	Rainbow trout	1,000	9-11
1993	Rainbow trout	1,000	9.0-14.0
1995	Rainbow trout	1,000	9.0-12.0
1996	Rainbow trout	750	9.0-12.0
1997	Rainbow trout	400	9.0-11.0

RESULTS

A total of 587 fish consisting of 13 species and 1 hybrid were captured from gill nets and trap nets set overnight, as well as night boat electrofishing in Shriner Lake (Table 2). The total weight of all captured fish was 317.83 lbs. The most abundant fish species in the lake were largemouth bass, bluegill, yellow perch, redear sunfish, and warmouth. The least abundant fish in this system were northern pike, yellow bullhead, brown bullhead, bowfin, spotted gar, hybrid sunfish, pumpkinseed, lake chubsucker, and black crappie.

Largemouth bass was the most abundant species captured and comprised 35.9% of the total catch (N = 211). These fish ranged in size from 4.6 to 14.0 in and had a batch weight of 155.27 lbs (48.9% of total weight). Captured bass were ages 1+ through 7+. Growth was average between age 1+ and 4+, but below average for older fish. The PSD was 14.2 and the RSD-14 was 0.01.

Bluegills were the second most abundant fish by catch (N = 139) and represented 23.7% of the total number of fish captured during the survey. In addition, this species was fifth in abundance by weight with 17.73 lbs (5.6%). These fish ranged in length from 1.5 to 10.1 in. Captured bluegills were ages 1+ to 8+. Growth was above average, PSD was 72.1, and RSD-8 was 27.9.

Yellow perch (length range, 4.7 to 13.7 in) were third in abundance based on total catch (N = 69; 11.8%). However, this species was ranked second based on percentage of weight (44.49 lbs; 14.0%) overall. The yellow perch in this lake were ages 1+ to 7+, growth was above average, and RSD-10 was 61.2.

Redear sunfish (N = 56) were the fourth most abundant species based on total catch (9.5%). This species comprised 4.5% of the total weight captured from the lake (14.40 lbs). These fish ranged in length from 2.8 to 9.8 in. and were ages 1+ to 4+.

Warmouth (N = 45) were ranked as the fifth most abundant species based on catch (7.7%). These fish only made up 3.4% of the total weight captured from the lake (10.85 lbs). This species ranged in length from 2.1 to 8.7 in. and were ages 1+ to 8+.

Water quality was determined for Shriner Lake (Appendix 1). Surface dissolved oxygen (DO) was 6.2 mg/L, however, adequate oxygen levels for fish were not present below 30 ft. The color of the water was greenish but clear, and the secchi disk reading was 11 ft, 2 in.

Table 2. Amount of effort and relative abundance of fish species collected from Shriner Lake, Whitley County, Indiana, in June 2004.

Species	**2004**	**1981**	**1978**	**1965**
Largemouth bass	211	85	63	154
Bluegill	139	54	242	245
Redear sunfish	56	1	22	213
Yellow perch	69	69	56	124
Warmouth	45	198	132	144
Northern pike	1	-	-	-
Yellow bullhead	15	17	22	2
Brown bullhead	4	31	5	2
Bowfin	3	2	2	3
Spotted gar	19	9	7	5
Hybrid sunfish	12	-	-	-
Pumpkinseed	3	69	59	134
Black crappie	4	2	2	4
Lake chubsucker	6	82	56	16
Spotted sunfish	-	30	50	92
Rainbow trout	-	1	-	22
Grass pickerel	-	42	20	11
Mimic shiner	-	-	-	2
Brown trout	-	20	13	-
Black bullhead	-	64	3	-
Blackchin shiner	-	Common	Common	-
Bluntnose minnow	-	Common	Common	-
Total	587	776	754	1,173
Effort	**2004**	**1981**	**1978**	**1975**
Electrofishing hrs	1.0	1.07	2.25*	4.0*
Gill net lifts	4	4	12	18.75**
Trap net lifts	3	6	12	-
Wire trap lifts	-	-	-	37.5**

*AC Electrofishing

**Surveys prior to 1978 measured effort in hours. Since 1978, surveys measured effort as the number of overnight sets.

Vegetation sampling resulted in the identification of 25 different species of submersed, emergent, floating, and shoreline vegetation, including *Vallisneria* (eel grass), coontail, American elodea, chara, white water lily, common duckweed, purple loosestrife, cattails, and pickerelweed (Appendix 1). *Vallisneria* (site frequency = 66%) and coontail (site frequency = 60%) were the

most dominant submersed plants in the sampled area. The dominant algae found during this survey was pithophora.

SUMMARY

The population structure of fish in Shriner Lake has changed since this lake was last surveyed in 1981. In 2004, bluegills and largemouth bass dominated the fishery, whereas in 1981, warmouth was the most abundant species in the lake. Bluegill growth was above average, and large bluegills were available in the lake. In comparison, largemouth bass growth was only average. In addition, there were many more largemouth bass captured in 2004 than in the 1981 and 1978 surveys, indicating a shift towards a bluegill-largemouth bass lake. Yellow perch, redear sunfish, and warmouth continue to provide excellent opportunities for fishing. In addition, no carp or gizzard shad were found during the lake survey. This is also the first time that northern pike have been captured during a fisheries survey by the DNR in this lake.

RECOMMENDATIONS

Because of the limited access to Shriner Lake, attempts to acquire property to put in a public access site should continue. The water quality in the lake at the time of the 2004 survey was adequate for fish survival. In addition, enough oxygen is present at cooler depths so trout stocking should be continued if public access to this lake is acquired.

Submitted by: Angela C. Benson
Assistant Fisheries Biologist
Date: October 28, 2004

Approved by: _____
Edward R. Braun
Fisheries Biologist
Date: December 3, 2004

Approved by: _____
Stuart T. Shipman
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Date: December 3, 2004

APPENDIX 1

Lake Survey Report

Relative Abundance of species by Number and Weight

Sampling Effort and Water Quality Parameters

Plant Survey Form

LAKE SURVEY REPORT

Type of Survey: [ ] Initial Survey [X] Re-Survey

Lake Name	County	Date of survey (Month, day, year)
Shriner Lake	Whitley	June 14-15, 2004
Biologist's name		**Date of approval (Month, day, year)**
Edward R. Braun		

LOCATION

Quadrangle Name	Range	Section
Columbia City	9E	11
Township Name	**Nearest Town**	
32N	Merriam	

ACCESSIBILITY

State owned public access site	Privately owned public access site	Other access site
None	Fee ramp at northeast end	County road easement east end

Surface acres	Maximum depth	Average depth	Acre feet	Water level	Extreme fluctuations
120	75	36	4,348	907	1 ft.

Location of benchmark

INLETS

Name	Location	Origin
Unnamed ditch	Northwest end	Unnamed pond
Unnamed ditch	South side	Runoff

OUTLETS

Name	Location
Unnamed channel	East end to Round Lake

Water level control: Concrete sill dam

POOL	ELEVATION (Feet MSL)	ACRES
TOP OF DAM		
TOP OF FLOOD CONTROL POOL		
TOP OF CONSERVATION POOL		
TOP OF MINIMUM POOL		
STREAMBED		

Bottom type

- [ ] Bolder
- [ ] Gravel
- [ ] Sand
- [ ] Muck
- [ ] Clay
- [ ] Marl

Watershed use: Residential and row crop farming

Development of shoreline: 99% developed for residential use.

Previous surveys and investigations: Hydrographic mapping U.S.G.S., 1925; Fisheries surveys (IDNR) 1965, 1970, 1972, 1975, 1978, 1981.

SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT					
*COMMON NAME OF FISH	NUMBER	PERCENT	LENGTH RANGE (inches)	WEIGHT (pounds)	PERCENT
Largemouth bass	211	35.9	4.6-14.0	155.27	48.9
Bluegill	139	23.7	1.5-10.1	17.73	5.6
Yellow perch	69	11.8	4.7-13.7	44.49	14.0
Redear sunfish	56	9.5	2.8-9.8	14.40	4.5
Warmouth	45	7.7	2.1-8.7	10.85	3.4
Spotted gar	19	3.2	16.8-26.9	23.75	7.5
Yellow bullhead	15	2.6	8.9-14.1	14.62	4.6
Hybrid sunfish	12	2.0	6.0-8.4	3.84	1.2
Lake chubsucker	6	1.0	6.7-10.1	2.02	0.6
Brown bullhead	4	0.7	7.3-15.1	5.04	1.6
Black crappie	4	0.7	4.3-4.6	0.19	0.1
Bowfin	3	0.5	24.3-28.8	20.17	6.3
Pumpkinseed	3	0.5	5.8-7.8	0.94	0.3
Northern pike	1	0.2	29.0	4.52	1.4
Total (13 Species/1 Hybrid)	587	100.0		317.83	100.0

SAMPLING EFFORT					
ELECTROFISHING	Day hours: 0		Night hours: 1		Total hours: 1
TRAP NETS	Number of traps: 3		Number of Lifts: 1		Total effort: 3
GILL NETS	Number of nets: 4		Number of Lifts: 1		Total effort: 4
ROTENONE	Gallons:	ppm:	Acre Feet Treated:	SHORELINE SEINING	Number of 100 Foot Seine Hauls:

PHYSICAL AND CHEMICAL CHARACTERISTICS		
Color: Green/Clear	Turbidity: 11 Feet 2 Inches (SECCHI DISK)	Air temperature: F
Water chemistry GPS coordinates: N		W

WATER QUALITY PARAMETERS															
DEPTH (Feet)	Degrees (F)	D.O.	SpC	pH	TDS	D.O.%	Turb.	DEPTH	Degrees (F)	D.O.	SpC	pH	TDS	D.O.%	Turb.
SURFACE	76	6.2	0.35		0.2	74.1	0.9	52	44.6	0	0.42		0.3	0	1.9
2	75.3	5.8	0.35		0.2	69.4	0.6	54	44.6	0	0.42		0.3	0	1.7
4	75.1	6.1	0.35		0.2	71.8	0.8	56	44.5	0	0.42		0.3	0	1.8
6	73.5	6.5	0.35		0.2	75.9	1.5	58	44.5	0	0.42		0.3	0	22
8	72.3	6.3	0.36		0.2	73.2	2.1	60	44.5	0	0.42		0.3	0	
10	71.3	5.8	0.36		0.2	66.5	2.8	62							
12	69.4	5.0	0.36		0.2	55.8	8.1	64							
14	66.8	4.5	0.36		0.2	49.2	5.9	66							
16	64.2	4.2	0.37		0.2	44.2	8.3	68							
18	61.2	4.0	0.38		0.2	41.3	13.3	70							
20	57	4.0	0.39		0.3	38.1	12.9	72							
22	54.2	3.9	0.40		0.3	36.4	14.2	74							
24	52	4.0	0.41		0.3	36.3	14.1	76							
26	49.5	3.7	0.41		0.3	32.7	15.5	78							
28	48.2	3.0	0.41		0.3	25.8	13.7	80							
30	46.9	2.1	0.41		0.3	17.8	12.3	82							
32	46.2	1.4	0.42		0.3	12.3	10.3	84							
34	45.7	1.0	0.42		0.3	8.1	6.7	86							
36	45.6	0.7	0.42		0.3	6.3	4.7	88							
38	45.2	0.4	0.42		0.3	3.2	3.2	90							
40	45	0.1	0.42		0.3	1.1	2.5	92							
42	44.9	0.1	0.42		0.3	0.7	2.3	94							
44	44.8	0.0	0.42		0.3	0	2.2	96							
46	44.7	0.0	0.42		0.3	0	2	98							
48	44.7	0.0	0.42		0.3	0	1.8	100							
50	44.6	0.0	0.42		0.3	0	1.8								

Occurrence and Abundance of Submersed Aquatic Plants

Date:	7/27/04	Littoral sites with plants:	35	Species diversity:	0.89
Littoral depth (ft):	20.0	Number of species:	16	Native diversity:	0.89
Littoral sites:	38	Maximum species/site:	7	Rake diversity:	0.88
Total sites:	40	Mean number species/site:	3.50	Native rake diversity:	0.88
Secchi:	14.6	Mean native species/site:	3.47	Mean rake score:	2.26

Common Name	Site frequency	Relative density	Mean density	Dominance
Vallisneria spp	65.8	0.89	1.36	17.9
Chara	31.6	0.58	1.83	11.6
Coontail	60.5	0.84	1.39	16.8
Curly-leaf Pondweed	2.6	0.03	1.00	0.5
Flat-stemmed Pondweed	21.1	0.21	1.00	4.2
Illinois Pondweed	7.9	0.21	2.67	4.2
Large-leaf Pondweed	13.2	0.13	1.00	2.6
Leafy Pondweed	21.1	0.21	1.00	4.2
Northern Watermilfoil	10.5	0.11	1.00	2.1
Pithophora	10.5	0.11	1.00	2.1
Sago Pondweed	2.6	0.03	1.00	0.5
Small Pondweed	10.5	0.11	1.00	2.1
Waterstargrass	10.5	0.11	1.00	2.1
Longleaf Pondweed	26.3	0.37	1.40	7.4
Variable Pondweed	21.1	0.21	1.00	4.2
Elodea sp	34.2	0.42	1.23	8.4

Other Observed Plants: Purple loosestrife, pickerelweed, cattail, water willow, spatterdock, white water common duckweed, arrow arum, pithophora

APPENDIX 2

Length Ranges for Largemouth Bass, Bluegill, and Yellow Perch for Each Gear Type: Gill Nets (GN), Electrofishing (EF), and Trap Nets (TN)

Body of water: Shriner Lake
Date: 6/14-15/2004
Species: Largemouth bass
PSD: 14.2

CPUE:
Gill nets = 5 fish/lift
Electrofishing = 190 fish/h
Trap nets = 0.3 fish/lift

	GN	EF	TN	Total
SS[a]	8	127	1	136
QS[b]	1	18	0	19
PS[c]	0	0	0	0
MS[d]	0	0	0	0
TS[e]	0	0	0	0
HS[f]	0	1	0	1
Total	20	190	1	211

[a]SS = stock size
[b]QS = quality size
[c]PS = preferred size
[d]MS = memorable size
[e]TS = trophy size
[f]HS = harvest size

Length	GN	EF	TN	Total	Age
4.5	0	1	0	1	1+
5.0	0	1	0	1	1+
6.0	0	2	0	2	2+
6.5	6	17	0	23	2+
7.0	4	27	0	31	2+
7.5	2	12	0	14	2+, 3+
8.0	0	3	0	3	3+
8.5	0	1	0	1	3+
9.0	0	5	0	5	3+, 4+
9.5	1	19	0	20	3+, 4+
10.0	3	18	0	21	3+, 4+
10.5	2	23	0	25	3+, 4+, 5+
11.0	0	18	1	19	3+, 4+, 5+
11.5	1	21	0	22	3+, 4+, 5+
12.0	1	13	0	14	3+, 4+, 5+
12.5	0	6	0	6	4+, 5+, 6+
13.0	0	1	0	1	4+, 5+, 6+
13.5	0	1	0	1	6+, 7+
14.0	0	1	0	1	6+, 7+

Body of water: Shriner Lake
Date: 6/14-15/2004
Species: Bluegill
PSD: 72.1

CPUE:
Gill nets = 0.3 fish/lift
Electrofishing = 50 fish/h
Trap nets = 29.3 fish/lift

	GN	EF	TN	Total
SS[a]	1	43	48	92
QS[b]	1	31	4	36
PS[c]	1	12	3	16
MS[d]	1	0	1	2
TS[e]	0	0	0	0
HS[f]	1	31	5	37
Total	1	50	88	139

[a]SS = stock size
[b]QS = quality size
[c]PS = preferred size
[d]MS = memorable size
[e]TS = trophy size
[f]HS = harvest size

Length	GN	EF	TN	Total	Age
1.5	0	1	0	1	1+
2.0	0	0	2	2	1+
2.5	0	3	20	23	1+
3.0	0	3	32	35	1+
3.5	0	1	18	19	1+, 2+
4.0	0	2	6	8	1+, 2+
4.5	0	0	2	2	1+, 2+
5.0	0	6	3	9	1+, 2+
5.5	0	3	0	3	1+, 2+
6.0	0	3	1	4	1+, 2+
6.5	0	2	1	3	1+, 2+
7.0	0	6	0	6	3+
7.5	0	7	0	7	3+, 4+
8.0	0	7	0	7	4+
8.5	0	4	0	4	4+
9.0	0	1	1	2	4+, 5+
10.0	1	1	2	4	7+, 8+

Body of water: Shriner Lake
Date: 6/14-15/2004
Species: Yellow perch

CPUE:
Gill nets = 16.8 fish/lift
Electrofishing = 1 fish/hr
Trap nets = 0.3 fish/lift

	GN	EF	TN	Total
SS[a]	67	1	0	68
QS[b]	64	1	0	65
PS[c]	40	0	0	40
MS[d]	16	0	0	16
TS[e]	0	0	0	0
HS[f]	65	1	0	66
Total	67	1	1	69

[a]SS = stock size
[b]QS = quality size
[c]PS = preferred size
[d]MS = memorable size
[e]TS = trophy size
[f]HS = harvest size

Length	GN	EF	TN	Total	Age
4.5	0	0	1	1	1+
6.5	1	0	0	1	1+, 2+
7.5	1	0	0	1	2+
8.0	5	0	0	5	2+
8.5	7	0	0	7	2+
9.0	8	0	0	8	2+, 3+
9.5	4	1	0	5	2+, 3+
10.0	1	0	0	1	3+
10.5	1	0	0	1	3+, 4+
11.0	5	0	0	5	3+, 4+
11.5	13	0	0	13	4+, 5+
12.0	12	0	0	12	4+, 5+
12.5	6	0	0	6	4+, 5+, 6+
13.0	1	0	0	1	5+
13.5	2	0	0	2	5+, 6+, 7+

Species: Largemouth bass
Intercept = 0.8

Year Class	Number Aged	Back Calculated Length(inches)at Each Age						
		I	II	III	IV	V	VI	VII
2003	2	3.9						
2002	28	3.7	6.5					
2001	24	4.1	6.5	9				
2000	37	4.1	6.9	9	10.5			
1999	6	3.1	6.7	8.6	9.7	10.9		
1998	4	3.6	7.2	9.2	10.8	11.8	12.4	
1997	2	2.7	4.1	6.8	7.8	9.5	11.4	11.9

Average Length	3.7	6.7	8.9	10.3	11.4	12.4	
Standard Deviation	0.44	0.3	0.26	0.6	0.61		
Yr. Classes Averaged	5	5	4	3	2	1	

Species: Bluegill
Intercept = 0.8

Year Class	Number Aged	Back Calculated Length(inches)at Each Age							
		I	II	III	IV	V	VI	VII	VIII
2003	21	2							
2002	35	1.7	3.5						
2001	12	1.5	3.2	6.7					
2000	9	1.3	2.5	5	7.8				
1999	2	1.5	2.7	4.8	6.8	8.2			
1997	1	1.9	3.2	5.7	8.3	8.7	9.2	9.5	
1996	3	1.5	2.7	4.8	7.5	8.9	9.2	9.5	9.8

Average Length	1.6	3	5.5	7.7	8.9	9.2	9.5	9.8
Standard Deviation	0.26	0.48	1.02	0.21				
Yr. Classes Averaged	5	4	3	2	1	1	1	1

Species: Yellow perch
Intercept = 1.2

Year Class	Number Aged	Back Calculated Length(inches)at Each Age						
		I	II	III	IV	V	VI	VII
2003	1	3.4						
2002	22	3	7.3					
2001	4	3	6	9.2				
2000	13	3.6	6.9	9.9	11.1			
1999	17	3	6.3	9.8	11.2	11.9		
1998	1	2.8	5.4	9.4	10.5	11.3	12.2	
1997	1	3.3	5.1	8.8	11.1	11.9	12.6	13.6

Average Length	3.1	6.6	9.6	11.2	11.9
Standard Deviation	0.29	0.59	0.39	0.1	
Yr. Classes Averaged	4	4	3	2	1